<u>IN THE CLAIMS</u>:

Please find below a listing of all pending claims. The statuses of the claims are set forth in parentheses. For those currently amended claims, <u>underlined</u> emphasis indicates insertions and ~~strikethrough~~ emphasis (and/or double brackets) indicates deletions.

1. (previously presented) An optical regenerator comprising:

an optical amplifier at an input of the regenerator;

an all-optical nonlinear device to provide a nonlinear transfer function between optical input power of an optical signal after the optical amplifier and optical output power of an optical signal after the nonlinear device;

an adjusting device to receive the optical signal after the nonlinear device, adjust the optical output power of the optical signal after the nonlinear device to a level of launch power from the regenerator, and output an adjusted optical signal;

a first monitoring device to monitor the optical signal after the optical amplifier and output a first monitoring signal;

a second monitoring device to monitor an optical signal after the adjusting device and output a second monitoring signal; and

a control unit to receive the first and second monitoring signals and control the optical amplifier based on the first monitoring signal and the adjusting device based on the second monitoring signal.

2. (original) The optical regenerator according to claim 1, further comprising:

a first optical coupler to tap a part of the optical signal after the optical amplifier to provide the first monitoring device with the tapped optical signal; and

a second optical coupler to tap a part of the optical signal after the adjusting device to provide the second monitoring device with the tapped optical signal.

3. (original) The optical regenerator according to claim 1, wherein the adjusting device includes an optical amplifier.

4. (original) The optical regenerator according to claim 1, wherein the adjusting device includes a variable attenuator.

5. (original) The optical regenerator according to claim 1, wherein the control unit communicates with one of another optical regenerator and a receiver via an optical supervisory channel.

6. (original) The optical regenerator according to claim 5, wherein the first monitoring device includes a photodiode to measure the optical input power of the optical signal after the optical amplifier.

7. (original) An optical fiber transmission system comprising an optical transmitter, an optical receiver, an optical fiber to connect the transmitter with the receiver, a plurality of optical amplifiers along the optical fiber to compensate absorption losses of a signal light passing through the optical fiber, and at least one optical regenerator according to claim 6, wherein the control unit controls the optical amplifier using a signal from the photodiode to adjust an optical input power to the nonlinear device to a preset value.

8. (original) The optical fiber transmission system according to claim 7,

wherein a target value of an average input power to the nonlinear device detected by the photodiode is set as the preset value at a time of installation of the regenerator in the optical fiber transmission system,

wherein the optical input power to the nonlinear device of each regenerator is adjusted such that a bit error rate at the receiver is minimized and an adjusted value is stored as the target value at the time of installation,

wherein a procedure of setting the target value is performed in backward direction starting from a regenerator closest to the receiver, and

wherein the optical supervisory channel is used for communication between a location of the receiver and each regenerator.

9. (original) The optical fiber transmission system according to claim 7,

wherein a target value of an average input power to the nonlinear device detected by the photodiode is set as the preset value at a time of installation of the regenerator in the optical fiber transmission system,

wherein the optical input power to the nonlinear device of each regenerator is adjusted such that a bit error rate before a nonlinear device in a subsequent regenerator or at the receiver in case of the last regenerator is minimized and an adjusted value is stored as the target value at the time of installation, and

wherein a procedure of setting the target value is performed in forward direction starting from a regenerator closest to the transmitter.

10. (original) A reconfigurable optical network comprising optical transmitters, optical receivers, at least one optical reconfigurable network node, optical fibers to connect the transmitters with the receivers via the reconfigurable nodes, a plurality of optical amplifiers along the optical fibers to compensate absorption losses of a signal light passing through the optical fiber, at least one optical regenerator according to claim 6, and a network control unit utilizing the optical supervisory channel to communicate with the transmitters, receivers, reconfigurable network node, and regenerator, wherein the control unit controls the optical amplifier using a signal from the photodiode to adjust an optical input power to the nonlinear device to a preset value.

11. (original) The reconfigurable optical network according to claim 10,

wherein a target value of an average input power to the nonlinear device detected by the photodiode is set as the preset value at a time a new optical path is established in the reconfigurable optical network,

wherein the optical input power to the nonlinear device of each regenerator is adjusted such that a bit error rate at a receiver is minimized and an adjusted value is stored as the target value at the time the new optical path is established,

wherein a procedure of setting the target value is performed in backward direction along the new optical path starting from a regenerator closest to the receiver, and

wherein the optical supervisory channel is used for communication between a location of the receiver and each regenerator.

12. (original) The reconfigurable optical network according to claim 10,

wherein a target value of an average input power to the nonlinear device detected by the photodiode is set as the preset value at a time of installation of the regenerator in the reconfigurable optical network,

wherein the optical input power to the nonlinear device of each regenerator is adjusted such that a bit error rate before a nonlinear device in a subsequent regenerator along an optical path or at a receiver in case of the last regenerator is minimized and an adjusted value is stored as the target value at the time of installation, and

wherein a procedure of setting the target value is performed in forward direction starting from a regenerator closest to a transmitter.

13. (original) The optical regenerator according to claim 5, wherein the first monitoring device includes a signal quality monitor to monitor a signal quality of the optical signal after the optical amplifier.

14. (original) An optical fiber transmission system comprising an optical transmitter, an optical receiver, an optical fiber to connect the transmitter with the receiver, a plurality of optical amplifiers along the optical fiber to compensate absorption losses of a signal light passing through the optical fiber, and at least one optical regenerator according to claim 13, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a feedback signal provided by a signal quality monitor in a subsequent regenerator or the receiver in case of the last regenerator via the optical supervisory channel.

15. (original) A reconfigurable optical network comprising optical transmitters, optical receivers, at least one optical reconfigurable network node, optical fibers to connect the transmitters with the receivers via the reconfigurable nodes, a plurality of optical amplifiers along the optical fibers to compensate absorption losses of a signal light passing through the optical fiber, at least one optical regenerator according to claim 13, and a network control unit utilizing the optical supervisory channel to communicate with the transmitters, receivers, reconfigurable network node, and regenerator, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a feedback signal provided by a signal quality monitor in a subsequent regenerator along an optical path or a receiver in case of the last regenerator via the optical supervisory channel.

16. (original) The optical regenerator according to claim 5, wherein the second monitoring device includes a signal quality monitor to monitor a signal quality of the optical signal after the adjusting device.

17. (original) An optical fiber transmission system comprising an optical transmitter, an optical receiver, an optical fiber to connect the transmitter with the receiver, a plurality of optical amplifiers along the optical fiber to compensate

absorption losses of a signal light passing through the optical fiber, and at least one optical regenerator according to claim 16, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a feedback signal provided by a signal quality monitor in a subsequent regenerator or the receiver in case of the last regenerator via the optical supervisory channel.

18. (original) A reconfigurable optical network comprising optical transmitters, optical receivers, at least one optical reconfigurable network node, optical fibers to connect the transmitters with the receivers via the reconfigurable nodes, a plurality of optical amplifiers along the optical fibers to compensate absorption losses of a signal light passing through the optical fiber, at least one optical regenerator according to claim 16, and a network control unit utilizing the optical supervisory channel to communicate with the transmitters, receivers, reconfigurable network node, and regenerator, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a feedback signal provided by a signal quality monitor in a subsequent regenerator along an optical path or a receiver in case of the last regenerator via the optical supervisory channel.

19. (original) An optical fiber transmission system comprising an optical transmitter, an optical receiver, an optical fiber to connect the transmitter with the receiver, a plurality of optical amplifiers along the optical fiber to compensate absorption losses of a signal light passing through the optical fiber, and at least one optical regenerator according to claim 16, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a signal from the signal quality monitor in the second monitoring device of the same regenerator.

20. (original) A reconfigurable optical network comprising optical transmitters, optical receivers, at least one optical reconfigurable network node, optical fibers to connect the transmitters with the receivers via the reconfigurable nodes, a plurality of optical amplifiers along the optical fibers to compensate absorption losses of a signal light passing through the optical fiber, at least one optical regenerator according to claim 16, and a network control unit utilizing the optical supervisory channel to communicate with the transmitters, receivers, reconfigurable network node, and regenerator, wherein the control unit controls the optical amplifier to adjust an optical input power to the nonlinear device using a signal from the signal quality monitor in the second monitoring device of the same regenerator.

21. (previously presented) An optical regenerator comprising:

an optical amplifier at an input of the regenerator;

an all-optical nonlinear device to provide a nonlinear transfer function between optical input power of an optical signal after the optical amplifier and optical output power of an optical signal after the nonlinear device;

a monitoring device to monitor the optical signal between the optical amplifier and the nonlinear device and output a monitoring signal; and

a control unit to receive the monitoring signal and control the optical amplifier based on the monitoring signal.

22. (previously presented) A method of controlling an optical regenerator which comprises an all-optical nonlinear device to provide a nonlinear transfer function between optical input power of an optical signal before the nonlinear device and optical output power of an optical signal after the nonlinear device, comprising:

amplifying the optical signal before the nonlinear device by an optical amplifier;

monitoring an amplified optical signal between the optical amplifier and the nonlinear device to generate a monitoring signal; and

controlling the optical amplifier based on the monitoring signal.

23. (original) The method according to claim 22, wherein a target value of the optical input power of the optical signal before the nonlinear device is preset at a time of installation of the regenerator in an optical fiber transmission system, by adjusting the optical input power such that a bit error rate at a receiver in the optical fiber transmission system is minimized and storing an adjusted value as the target value.

24. (original) The method according to claim 23, wherein a procedure of setting the target value is performed in backward direction starting from a regenerator closest to the receiver.

25. (original) The method according to claim 22, wherein a target value of the optical input power of the optical signal before the nonlinear device is preset at a time of installation of the regenerator in an optical fiber transmission system, by adjusting the optical input power such that a bit error rate before a nonlinear device in a subsequent regenerator or at a receiver in case of the last regenerator in the optical fiber transmission system is minimized and storing an adjusted value as the target value.

26. (original) The method according to claim 25, wherein a procedure of setting the target value is performed in forward direction starting from a regenerator closest to a transmitter in the optical fiber transmission system.

27. (original) The method according to claim 22, wherein a target value of the optical input power of the optical signal before the nonlinear device is preset at a

time a new optical path is established in a reconfigurable optical network, by adjusting the optical input power such that a bit error rate at a receiver in the reconfigurable optical network is minimized and storing an adjusted value as the target value.

28. (original) The method according to claim 27, wherein a procedure of setting the target value is performed in backward direction along the new optical path starting from a regenerator closest to the receiver.

29. (original) The method according to claim 22, wherein a target value of the optical input power of the optical signal before the nonlinear device is preset at a time of installation of the regenerator in a reconfigurable optical network, by adjusting the optical input power such that a bit error rate before a nonlinear device in a subsequent regenerator along an optical path or at a receiver in case of the last regenerator in the reconfigurable optical network is minimized and storing an adjusted value as the target value.

30. (original) The method according to claim 29, wherein a procedure of setting the target value is performed in forward direction starting from a regenerator closest to a transmitter in the reconfigurable optical network.